

REMARKS

Claims 1, 4-11 and 21-24 are all the claims pending in the application. Claims 1, 4-11 and 21-24 presently stand rejected.

Drawings:

The Examiner has indicated acceptance of the replacement drawing figures filed on September 13, 2006.

Claim Objections:

Claim 21 is objected to because of informalities. Applicants amend claim 21 to overcome this minor objection.

New Matter Rejection:

Claim 24 is rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner rejects the claim for containing new matter because the specification does not support the limitation “the clearance is established at room temperature”. In view of this rejection, Applicants amend claim 24 to clarify that the clearance is established at an ordinary temperature. “Ordinary temperature” is discussed in published paragraph [0076], and thus, this change is fully supported by the specification.

Prior Art Rejections:

Claims 1, 4-7, 9, 11, 21, 23 and 24 are rejected under 35 U.S.C. § 102(b) as being anticipated by newly cited Dent (3,652,111).

Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Dent (3,652,111) in view of Fujioka et al. (4,716,756).

Claims 10 and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dent (3,652,111) in view of Edgemond, Jr. (3,642,311).

Analysis

Claims 1 and 21 are the only claims currently in independent form; therefore, the following discussion is initially directed to these independent claims.

Dent is cited against both claims 1 and 21 in anticipation thereof. Dent is directed to a method of swage joining a metallic tube 22 to an insert 10. As illustrated in the drawings, four sections (1-4) are provided on the outer circumferential surface of the insert, each having a set of “annular crests and valleys”. In addition, longitudinally extending grooves 64 are provided on the insert. The grooves 64 gradually decrease in depth so as to taper out in section 4 of the insert 10.

Turning to claim 1, Dent fails to disclose that each of the grooves has a cross section having opposed faces substantially in parallel with each other. Rather, at least the annular grooves are formed in a valley and crest shape, i.e., the valley shape has two sloping surfaces and the crest is formed at the peak between two adjacent valleys. The crests have flank angles of 60 degrees (see col. 6, lines 25-26 and FIG. 8). Thus, the lines A1, which are annotated on FIGS. 4 and 8 in the Office Action, do not correspond to parallel faces. Rather, to the contrary, they intersect at a 60 degree angle.

Still further, there is no support that the longitudinal groove has parallel opposing faces either. The drawings do not illustrate a cross-section of the longitudinal grooves 64 and thus there is no illustration of parallel opposing faces for the groove 53. Further, the drawings do not

even suggest this claimed structure. There is simply no support anywhere in the text or illustrations of this structure.

Thus, Dent does not anticipate claim 1.

Turning to independent claim 21, again, Dent fails to disclose that at least one of the grooves has a cross section having opposed faces substantially in parallel with each other. Lines A1, which are annotated on FIGS. 4 and 8 in the Office Action by the Examiner, do not correspond to parallel faces. Rather, to the contrary, the annular grooves in FIG. 8 are formed by “crests and valleys”, which are formed to intersect at 60 degrees. Still further, the longitudinal grooves 64 are simply described as grooves, with no teaching or suggestion that they are formed to have a cross section having opposed faces substantially in parallel with each other. There is no teaching or suggestion in the text that the grooves have a cross section with parallel opposing faces. Moreover, the drawings do not illustrate this structure either. Dent fails to provide even an illustration of the cross-section of the grooves 64, and there is no support for alleging that there is any support in the drawings for that the opposing faces of the grooves 64 are in parallel.

Still further, Dent fails to disclose a caulked portion provided to the cylindrical member at a position corresponding to the at least one groove of the shaft member, having an inner surface in press contact with the opposed faces of the groove. As discussed above, the opposed faces of the claimed at least one groove in claim 21 are substantially in parallel. Dent not only fails to disclose that the opposed faces of the grooves in the shaft 10 are in parallel, but likewise fails to disclose that a caulked portion of the cylindrical member 22 are in press contact with such parallel faces.

Still further, even if one were to assume, arguendo, that a caulked portion exists on the cylindrical member to correspond to the longitudinal groove 64 (as alleged in the Office Action at page 6), Dent does not disclose that the cylindrical member 22 is spaced apart from the shaft member by a clearance except at this caulked portion. The annotated FIG. 8 in the Office Action includes “A2” which supposedly refers to the claimed clearance. However, this portion “A2” is merely the end portion of the shaft 10, which has a tapered edge. The present invention has a clearance between the cylindrical member and shaft member except at the caulked portion; thus, the cylindrical member and shaft member are entirely formed with a clearance therebetween except at the claimed caulked portion. If the caulked portion in Dent is that portion of the cylindrical member which is in press contact with the longitudinal groove 64, the remaining areas between the shaft and cylindrical member should be formed with a clearance in order to meet this limitation of claim 21. However, this is clearly not the case since every crest of the shaft 10 is in contact with the cylindrical portion 22 (see FIG. 8). That is, crests 38 and 42 of the shaft 10, for example, are in complete contact with the valleys of the cylindrical member 22. As discussed at col. 6, lines 1-24, the crests and grooves in the insert “directly mate” with the mating grooves of the tube 22. Still further, Dent specifically provides that during swaging, the metal of the tube 22 migrates to fill all voids and grooves of the shaft 10. The tube 22 is cold formed to an internal configuration which precisely follows the external configuration of the shaft 10. See col. 4, lines 63-75. Therefore, the clearance is only formed at the end annotated at A2 by the Examiner, rather than everywhere except the caulked portion at groove 64.

Thus, Dent does not anticipate claim 21.

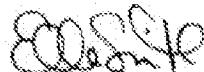
The remaining rejections are directed to the dependent claims. These claims are patentable for at least the same reasons as claims 1 and 21, by virtue of their dependency therefrom.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Ellen R. Smith
Registration No. 43,042

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
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CUSTOMER NUMBER

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